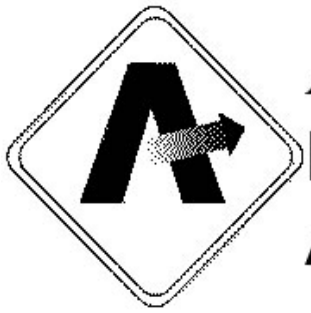

ADVOCATES FOR HIGHWAY AND AUTO SAFETY

July 6, 2004

Docket No. NHTSA-2003-15715
Docket Management Facility
U.S. Department of Transportation
Nassif Building, Room PL-401
400 Seventh Street, S.W.
Washington, D.C. 20590

Request for Comments; Occupant Protection Standard
High Speed Frontal Offset Crash Test
69 FR 5108, February 3, 2004

Advocates for Highway and Auto Safety (Advocates) appreciates the opportunity to provide comments in response to the notice of the National Highway Traffic Safety Administration (NHTSA) regarding whether to propose a high speed frontal offset crash test requirement.[1] The agency notice requests comments on a number of issues including the agency's assessment of potential benefits that would accrue from required frontal offset crash testing, as well as potential disbenefits that might result from the adoption of stiffer front end designs.

Advocates has long supported the adoption of a high speed frontal offset crash test. A high speed frontal offset crash test has been adopted by the European Union as part of its frontal crash testing requirements,[2] and a high speed offset test has privately been used successfully by the Insurance Institute for Highway Safety (IIHS) since 1995.[3] The adoption of a frontal offset crash test is an important addition that will complement the crash data obtained in the full frontal barrier crash test. The full frontal crash test models an extremely severe head-on crash, which was at one time (before three point lap/shoulder belts and air bags) the most lethal crash scenario. The full frontal crash test provides a demanding test of the performance of the vehicle restraint systems. However,

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[1] The NHTSA extended the comment period for this docket until Monday, July 5, 2004. 69 FR 18015 (April 6, 2004). These comments are timely since July 5, 2004 is an official federal government holiday and these comments are submitted on the next business day.
[2] EU Directive 96/79/EC (Dec. 1996) (became effective for all vehicles as of Oct. 2003).
[3] The EU test procedure is also used to evaluate new cars in Australia and Japan, IIHS News Release, June 13, 2004, available online at the IIHS website: www.highwaysafety.org/news_release/2004/pr061304.htm.

because the entire front end of the test vehicle contacts the barrier the crash forces are distributed over the entire vehicle front end. Engaging the entire front end provides comparatively optimal circumstances for the management of crash forces and, thus, does not present a very severe test of the vehicle structure. As a result, the frontal crash test generally results in relatively little localized intrusion into the occupant compartment. Moreover, the full frontal test represents only a minority of real world crashes. For these reasons, a frontal offset crash test that concentrates crash forces on one side of the test vehicle's front end, has long been considered desirable to provide a more stringent test of front end structural resistance against occupant compartment deformation and intrusion. It also represents a majority of real world crashes.

It has also become clear that no single crash test can properly model the dynamics of all real world crashes and take into account all aspects of safety protection. As with the new requirements for advanced air bags,[4] a matrix of different tests are needed to afford full safety protection in a comprehensive manner. A low-speed frontal offset test using a deformable barrier has already been adopted to improve the performance of advanced air bag systems.[5] Advocates views the eventual adoption of a high speed frontal offset test as an important step in the evolution of occupant protection requirements.

There is no question that a high speed frontal offset crash test will improve occupant safety and provide significant benefits. Improving protection by reducing intrusion will eliminate or ameliorate moderate to serious lower limb injuries due to toe pan and floor pan intrusion and intrusion from other sources. In 1997 NHTSA stated it believed that adoption of the EU test procedure could "yield benefits in terms of a reduction in lower limb injuries."[6] In addition, a recent agency study of intrusion in crashes with roadside hardware found a statistically significant relationship between intrusion of 8 to 15 centimeters into the vehicle occupant compartment and non-minor injuries indicating that "many moderate to maximum injuries occurred at intrusions less than 15 centimeters."[7] Advocates concurs with the agency notice that safety improvements resulting from a frontal offset crash test procedure will likely also include a potential reduction in neck injuries for small statured occupants.

The NHTSA must balance the potential benefits against any unintended consequences or disbenefits that may arise from the adoption of stiffer front end designs that may lead to greater occupant compartment deformation and intrusion in two-vehicle

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[4] *See* additional testing requirements in advanced air bag final rule, 65 FR 30680 *et seq*. (May 12, 2000).
[5] *Id*., at 30754 (49 C.F.R. 571.208 S18).
[6] "Report to Congress: Status Report on Establishing a Federal Motor Vehicle Safety Standard for Frontal Offset Crash Testing," p. 4, NHTSA (April 1997).
[7] "The Relationship Between Occupant Compartment Deformation and Occupant Injury," p. 13, NHTSA Technical Report DOT HS 809 676 (Nov. 2003) (Study conducted by the NHTSA's National Center for Statistics and Analysis for the Federal Highway Administration).

crashes. This could be especially true, as the agency notes, should the front end designs of light trucks and vans (LTVs) and Sport Utility Vehicles (SUVs) become even stiffer in order to perform well in the frontal offset crash test. Currently, the issue of crash compatibility is already a major safety problem, and the agency and others have documented that occupants in cars are at an extreme disadvantage when struck by a larger, heavier, stiffer crash partner. Should front end designs of LTVs and SUVs be made even stiffer to provide increased protection in frontal offset crashes, the safety compatibility disparities would be exacerbated.

However, studies indicate that vehicle stiffness is not a necessary outcome or the only means of improving protection in an offset crash test. For example, IIHS researchers found that in response to frontal offset tests the "majority of vehicles whose structural performance improved did so without significant alteration to the stiffness of the vehicle for the first half-meter of deformation."[8] Other research indicates that there is a wide range of stiffness in LTV and SUV models including designs with stiffness similar to passenger vehicles, suggesting that at least with respect to front end stiffness that "compatible vehicle designs between passenger cars and LTVs may exist in the fleet."[9] Moreover, manufacturers have indicated that frontal offset testing requirements can be met without increasing front end stiffness at the corners.[10] Advocates believes that given the greater focus on crash compatibility, and efforts to limit the aggressivity of vehicles in crashes, increasing stiffness in order to comply with any frontal offset crash test requirement should be monitored and discouraged. Ultimately, assuming an appropriate metric is defined, LTV stiffness could be limited as part of the frontal offset test procedure.

The NHTSA notice suggests that one possible approach to ensure that LTV and SUV front ends do not get stiffer is to require passenger cars to meet a frontal offset test but to exclude LTVs and SUVs from such a requirement. The agency notes that it estimates that "approximately 77 percent of the benefits of a high speed frontal offset regulation would accrue to passenger car occupants." 69 FR 5108, 5113 (Feb. 3, 2004). Advocates does not believe that creating such a distinction is either necessary or desirable. First, we believe, as stated above, that increases in front end stiffness are not the inevitable result of improvements to meet the requirements of a high speed frontal offset test. More and better energy absorbing strategies, materials, and designs can be employed rather than increased stiffness. Second, it is now generally accepted that safety

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[8] Nolan & Lund, "Frontal Offset Deformable Barrier Crash Testing and Its Effect on Vehicle Stiffness" (2001) in *Proceedings of the 17th International Technical Conference on the Enhanced Safety of Vehicles,* Washington, D.C., National Highway Traffic Safety Administration, DOT HS 809 220 (June 2001).
[9] Swanson *et al.,*" Evaluation of Stiffness Measures From the U.S. New Car Assessment Program" (2003), in *Proceedings of the 18th International Technical Conference on the Enhanced Safety of Vehicles,* Washington, D.C., National Highway Traffic Safety Administration, DOT HS 809 543 (May 2003).
[10] *See* comments of American Honda Motor Company dated April 5, 2004, filed in this docket NHTSA-2003-15715.

regulations and testing requirements should apply to all types of passenger vehicles unless there is a strong reason not to do so. The previously held view that cars and LTVs are distinct types of vehicles and should be separately regulated has been abandoned now that LTVs are predominantly designed and marketed as passenger, and especially as family, vehicles. Third, although cars may receive the majority of potential benefits from frontal offset testing according to agency estimates, nonetheless LTVs would benefit to some degree. That improvement in occupant protection and safety should not be discarded unless absolutely necessary. Fourth, and finally, not all crashes involve vehicle-to-vehicle crashes. Increased resistance to occupant compartment deformation and deep, localized intrusion have direct corollary benefits in frontal impacts with fixed objects including roadside hardware and highway appurtenances, especially those with narrow cross sections such as trees and poles.[11] In single vehicle crashes, representing 40 percent or more of LTV and SUV crashes, these vehicles should be afforded the improved protection that will be derived from frontal offset crash testing.

For all the reasons stated above, Advocates continues to strongly support the addition of a high speed frontal offset crash test to the occupant protection standard. While we also concur that NHTSA should be concerned about potential trade-offs should vehicle stiffness increase, we are convinced that a high speed frontal offset test need not result in increased vehicle stiffness and that other measures can be taken to ensure that does not happen.

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[11] Such crashes led the Federal Highway Administration request a study of its 15-centimeter guideline as the pass/fail point for roadside safety hardware. *See* note 7 *supra.*